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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/841,871      | 04/24/2001  | David M. Keicher     | ODC1120-DIVA        | 6152             |

7590 04/21/2003  
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EXAMINER

FULLER, ERIC B

|          |              |
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| ART UNIT | PAPER NUMBER |
|----------|--------------|

1762

DATE MAILED: 04/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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**Office Action Summary**

Application No.

09/841,871

Applicant(s)

KEICHER ET AL.

Examiner

Eric B Fuller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Request for Continued Examination***

The Request filed on February 20, 2003 for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 09/841,871 is acceptable and an RCE has been established. An action on the RCE follows.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the independent claims, "adjacent to laser deposition head outlets" is confusing. Specifically, it is unclear if the head outlets are meant to mean the output of the before mentioned laser nozzle assembly or if it is an output from any laser deposition. For examination purposes, "laser deposition head outlets" is assumed to mean the powder and laser beams that are leaving the laser nozzle assembly.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5, 9-11, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer et al. (US 6,197,386 B1) in view of Harwell et al. (US 6,143,378).

Beyer teaches a process of coating a substrate. Powder is sprayed onto the substrate and heated by a laser while on the substrate (column 2, lines 19-36). From figure 1, the powder (2) is sprayed perpendicular to the substrate (5) and the laser (3) meets the substrate (5) at an angle to the surface. Beyer teaches relative motion between the outlets and the substrate (column 3, lines 35-50). The reference teaches that multiple lasers may be used to control the temperature of the substrate (column 3, lines 51-62), but fails to teach multiple powder nozzles and multiple lasers that are all directed to approximately a same location.

However, Harwell teaches that when the material feed is fed perpendicular and the laser is directed at an angle, multiple lasers that are directed to the same location are used in order to ensure the melt pool is symmetric, which increases the quality of the deposited layer (column 3, line 43 – column 4, line 17). Additionally, multiple material feed sources are taught in order to increase deposition rate and/or vary the composition of the layer (column 7, lines 48-57). The material is feed to the same location as the multiple lasers are directed (figure 5). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize multiple lasers, to produce a symmetric melt pool, and multiple powder feeders

directed to approximately the same location. By doing so, one would reap the benefits of increased layer quality, deposition rate, and/or composition control. It is the position that although the figures only show two lasers, the word "multiple" would make obvious "three or more".

Additionally, Harwell teaches that multiple lasers may be used or a split single laser beam (column 4, lines 60-65). A split single laser beam used throughout the entire process reads on the limitations of claims 5 and 13.

Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer et al. (US 6,197,386 B1) in view of Harwell et al. (US 6,143,378), as applied to claims 1 and 9 above, and further in view of Jeantette et al. (US 6,046,426).

Beyer in view of Harwell teaches the limitations of claims 1 and 9, but fails to teach using a CAD model to provide the relative motion. However, Jeantette teaches the CAD model is used to provide precision in deposition (column 9, lines 40-50). Therefore, it would have been obvious to use a CAD model in the process taught by Beyer in view of Harwell. By doing so precision of the deposition is increased.

Claims 1-3, 5-11, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer et al. (US 6,197,386 B1).

Beyer teaches the limitations as shown above, but fails to teach multiple powder nozzles and multiple lasers that are all directed to approximately a same location. However, it would have been obvious to one of ordinary skill in the art that a second (or

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third) apparatus (laser and feeder) located near the apparatus of Beyer would have the added benefit of being able to supply more powder to the surface of the substrate than a single apparatus would, thereby increasing the deposition rate and decreasing deposition time. To do this is a mere duplication of parts, which has been held by the courts to be obvious. *St. Regis Paper Co. v. Beemis Co. Inc.* 193 USPQ 8, 11 (1977); *In re Hazza* 124 USPQ 378 (CCPA 1947).

As to claims 5-8 and 13-16, one of ordinary skill in the art would recognize that the multiple apparatuses provide a greater deposition rate by providing more powder in a larger deposition area. Thus, precision and deposition rate have an inverse relationship when increasing the number of apparatuses used. From this, it would have been obvious to use a single apparatus when depositing in areas where precision is more important than deposition rate, such as outlining features, and to employ multiple apparatuses when deposition rate is of priority, such as filling in featureless regions. In order to achieve this, one of skill would recognize that the lasers of each apparatus must be modulated on and off independently of each other.

Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beyer et al. (US 6,197,386 B1, as applied to claims 1 and 9 above, and further in view of Jeantette et al. (US 6,046,426).

Beyer teaches the limitations of claims 1 and 9, but fails to teach using a CAD model to provide the relative motion. However, Jeantette teaches the CAD model is used to provide precision in deposition (column 9, lines 40-50). Therefore, it would

have been obvious to use a CAD model in the process taught by Beyer. By doing so precision of the deposition is increased.

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeantette et al. (US 6,046,426).

Jeantette teaches the limitations of claim 1 in column 12, lines 32-64, except for the limitation of multiple lasers. However, it would have been obvious to one of ordinary skill in the art that a second (or third) apparatus located near the apparatus of Beyer would have the added benefit of being able to supply more powder to the surface of the substrate than the single apparatus, thereby increasing the deposition rate and decreasing deposition time. To do this is a mere duplication of parts, which has been held by the courts to be obvious. *St. Regis Paper Co. v. Beemis Co. Inc.* 193 USPQ 8, 11 (1977); *In re Hazza* 124 USPQ 378 (CCPA 1947).

As to claims 5 and 12, Jeantette teaches the motion is controlled by a CAD model (column 9, lines 40-45).

As to claims 5-8 and 13-16, one of ordinary skill in the art would recognize that the multiple apparatuses provide a greater deposition rate by providing more powder in a larger deposition area. Thus, precision and deposition rate have an inverse relationship when increasing the number of apparatuses used. From this, it would have been obvious to use a single apparatus when depositing in areas where precision is more important than deposition rate, such as outlining features, and to employ multiple apparatuses when deposition rate is of priority, such as filling in featureless regions. In

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order to achieve this, one of skill would recognize that the lasers of each apparatus must be modulated on and off independently of each other.

### ***Response to Arguments***

Applicant argues that Uchiyama et al. fails to teach the claims as they have now been amended. Examiner agrees. Specifically, although Uchiyama teaches that the powder is heated on the substrate by a laser, this fails to read on being heated on the substrate by "said lasers". Accordingly, the rejection of the previous Office Action has been withdrawn. Applicant's arguments are moot in view of the new grounds of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B Fuller whose telephone number is (703) 308-6544. The examiner can normally be reached on Mondays through Thursdays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck, can be reached at (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



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EBF  
April 16, 2003



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